British corporate networks, 1976-2010: extending the study of finance-industry relationships.

Using an extensive and unique dataset that has been created to record the composition of the boards of directors of the Top 250 British firms between 1904 and 2010, this article builds upon a previous study on the corporate network to 1976 by extending the study to 2010. The analysis revolves around three key observations: the nature and depth of the corporate network; the distinct stages in corporate connectivity between 1976 and 2010, and the 1980s watershed in the relationship between financial and other sectors. The article will conclude with an analysis of how the dataset has changed our perceptions of British corporate networks and a discussion of implications for future research.

Keywords*: Corporate Networks; Banking; Financial Sector; Industrial Sector; Directors*

Introduction

While an extensive literature analysing the relationship between British financial institutions and the rest of British business has been generated, it is apparent from a detailed and long-term investigation of the corporate network that aspects relating to inter-organisational relationships and wider patterns associated with the financialisation of British business need to be further examined. The authors recently revisited patterns of corporate connectivity in Britain from the beginning of the twentieth century to 1976,[1] illustrating the continuing shifts in British business and the dramatic changes experienced in the financial sector. The motivation behind this article is to extend the study to 2010 in order to gain further insights into patterns of corporate connectivity, thereby revealing previously unrecorded changes in British corporate networks, particularly a change in the nature of outside directors of public companies. Scott and Griff, who conducted a study of the British corporate network up to the 1980s, concluded that British business was dominated by financial interests,[2] given both the latter's extensive representation on boards of directors and recent changes in ownership structures. More recently, Froud et. al. repeat this overarching claim, noting that British corporate strategy had come to be dominated by "financialization", namely, the primacy of maximising shareholder value in order to limit the risk of exit by the financial institutions that have come to own the bulk of the equity in British business.[3] Of course, dramatic shifts in British business are nothing new, in that Hannah's seminal work highlights cycles of corporate activity that transformed the British business landscape over the course of the twentieth century.[4] Nevertheless, the work of Hannah, Toms et al., and most recently our own, pinpoint a distinct gap in our understanding of board interlocks in UK public companies.[5]

Examining macro-trends in inter-organisational relationships across industries and decades allows one to identify specific patterns related to corporate connectivity, such as the presence of intra- and inter-industry links, changing centrality in various sectors over time and the connectivity of financial institutions. It is also important to add that at no stage do we assume director connections between firms represent (inter)organisational power and influence.[6] An established literature on networks in business history as well as corporate networks in particular demonstrates that links between firms formed by inter-personal relationships are significant, even if the data does not explicitly reveal the intricacies of such relationships.[7] The presence of a non-executive director, chairman, chief executive officer, etc. active on multiple company boards acts as a conduit between firms through which resources pass, whether they be tangible or intangible. While the authors acknowledge the alternate view that perhaps these relationships are of little significance, the extensive literature on networks finds that the existence of a relationship at all will have some impact in relation to the boards on which they serve.[8] Using a consolidated methodology tool which is now part of this quickly developing literature on the corporate network of interlocking directors, the article covers these issues, providing key insights into inter-organizational relationships, particularly those between financial institutions and industrial companies, and assessing the role of a vast range of financial players in British business. Illuminating distinct patterns within British corporate connectivity and the position of financial institutions in the network as a whole offers a unique perspective into the impact of continually changing policies and codes of practice that govern boards of directors, increasing involvement of foreign companies and adaptations in the role of financial institutions in British business. Alongside examining the position of commercial banks in the network, we also give deserved attention to the position and connectivity of other financial institutions, such as insurance and pension funds, merchant banks, trusts and similar players. This wider perspective reveals numerous pathways for further research that could have significant implications for assessing the effectiveness of the British regulatory environment, inter-organisational responses to crises and the impact of increasing global financial connectivity.

In generating fresh insights into the dynamics at play within British business, an extensive and unique dataset has been created to record the composition of the boards of directors of the Top 250 British firms (according to net assets) between 1976 and 2010. We have chosen to begin our examination in 1976, a post-crisis period which ushered in a new era, signifying a distinct change in the nature of Britain's financial system and corporate activity in general.[9] Additionally, although inter-war industry reports focused on the role of banks in British industry, by the 1970s financial institutions other than commercial banks (such as insurance companies, pension and investment funds, merchant banks, etc.) played a much greater role in industry. Our focus will be on these financial institutions and their position in the corporate network, demonstrating the extent to which boards were connected at different points over the last half-century.[10]

The analysis provides the basis for three key observations that offer a fresh view of the relationship between the boards of Britain's major corporations. Firstly, we observe from our data a general move across British business from a well-integrated, dense corporate network to one that is far more dispersed. This is consistent with existing empirical evidence that associates this dispersion with a lack of shareholder engagement in the management of their portfolio companies, a trend that remains unchanged when international investors became the dominant owners of UK equities (see Figure 1).[11] Secondly, the data reveals distinct stages in corporate connectivity between 1976 and 2010 (pre-Cadbury, post-Cadbury, and post-2008 crisis). Interestingly, we also note that these stages are accompanied by significant shifts in the patterns of ownership of major British businesses, changing regulations that governed board activity, and the growing complexity of transactions, resulting from an influx of a plethora of financial intermediaries. Thirdly, one can identify a watershed in the relationship between the financial and industrial sectors in the 1980s, at which point financial institutions started to withdraw from the UK corporate network as a result of the pursuit of global strategies and a preference for highly speculative, short-term financial trading.[12]

Starting with a brief synopsis of the various literatures analysing these trends, our paper will move on to explain the methods and data employed in pursuing this research project, focusing our attention primarily on the depth and nature of the intercorporate networks that existed from the 1970s into the early twenty-first century. This will provide the basis for an original analysis of the relationship between and within sectors, contributing extensively to important debates on the evolution of corporate governance and cycles of corporate connectivity in Britain over this fifty-year period.[13] The article will conclude with an analysis of how the dataset has changed our perceptions of British corporate networks, feeding directly into policy debates and recent work by the Bank of England on the interconnectedness of British financial institutions.[14]

Literature Review: UK corporate boards and Board Interlocks

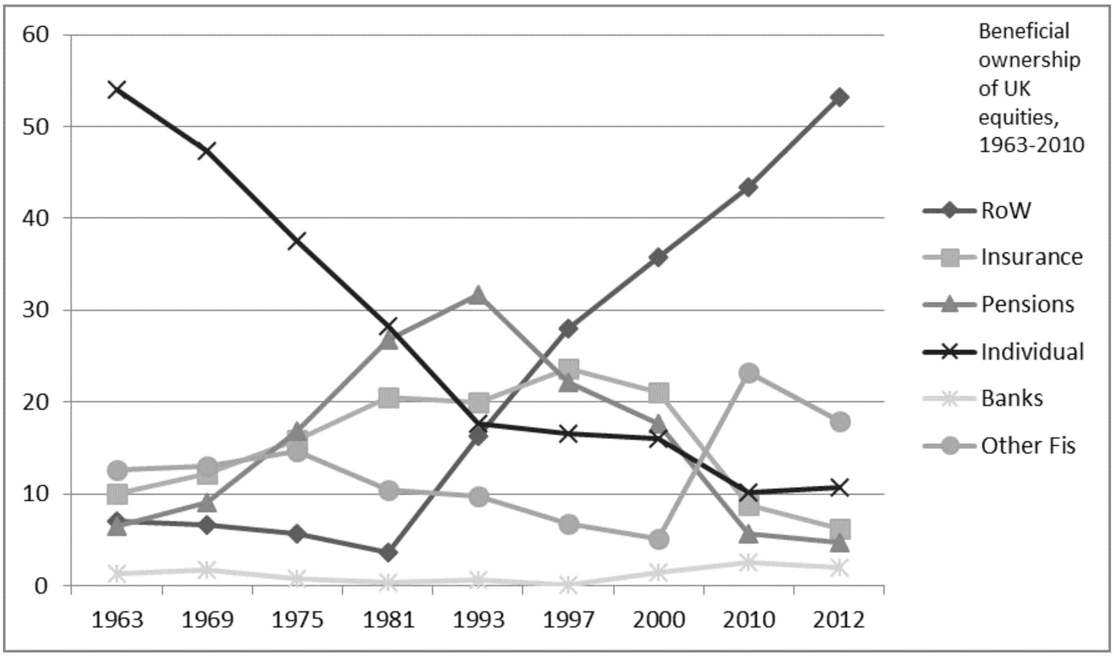
Studies of British business and corporate relations over the past century have focused on varied themes, the most prevalent of which have been the role of British banks in the wider business landscape and Britain's industrial decline.[15] Discussion and analysis of the relationship between companies, particularly financial institutions, continues to prevail. Garnett, Mollan and Bentley demonstrate the illuminating patterns that can be deciphered from examining relationships between banks over long periods, designating them as a 'system of discreet, interacting agents'.[16] Similarly, in their investigation of private equity in the UK, Toms and Wright stress the importance of examining inter-organisational relationships (both inter- and intra-sectorally) through comparative periodisations, thereby drawing broader conclusions regarding corporate activity in the private equity sector.[17] Turner also takes this long-run view of understanding banking and crises as cyclical and inter-related,[18] while our own research on corporate networks from 1904-1976, as well as this study of the later period, contribute to these long-run examinations by highlighting significant trends in British corporate connectivity over a century.[19] These connections between companies, specifically at board level, offer a particularly unique perspective to studying interorganisational relationships over time.

Other scholars have emphasised the importance of these board level connections. Examining financial syndicates, Bowden's work on the crisis at Rolls-Royce identified the importance of intra-sectoral ties in finance in assisting endangered corporations.[20] Similarly, Toms and Wright examine the importance of syndicates in domestic industry and the market for corporate control, which had considerable implications for board level relationships.[21] It should be noted that in this paper we do not assume that director connections between firms represent (inter)organisational power and influence. There is an established literature on organisational power and influence in the field of organisational behaviour, which suggests that power can be characterised as the capacity or ability to affect outcomes.[22] McNulty and Pettigrew suggest that power involves the ability to produce intended effects in line with one's perceived interests'.[23] Significantly for this paper, it is important to stress Pettigrew and McNulty's argument that possession of power sources is only a route to potential power, and that the ability to use power or to produce intended effects in line with one's perceived interests depends on the context, will and the skills of the individuals. This theorisation allows us to assume that director interlocks are suggestive of power and influence *potential,* rather than the actual influence, measurement of which extends well beyond the scope of this paper.[24]

One significant factor that has shaped not only the corporate network but also the general nature of British business in recent decades is the continual shifting patterns of ownership of British firms. It is apparent that over the twentieth century the nature of institutional ownership in particular changed from dispersed and passive to re-concentrated, yet still passive. In separate articles, Davis and Jackson have claimed that a lengthening of the investment chain and increasing number of financial intermediaries involved in corporate ownership resulted in a transition from "Managerial Capitalism" to an era of "New Financial Capitalism", namely, a system characterised by a re-concentration of corporate ownership in the hands of large investment fund managers, the bulk of whose activity was based on the pursuit of short-term investment strategies.[25] By the early twenty-first century, UK institutional investors' portfolio turnover had reached 56%,[26] while the average holding periods of shares has fallen from six years in the 1960s to less than six months by 2015.[27] Crucially, there is extensive empirical evidence of investor disengagement, inefficient monitoring and lack of influence over corporate management.[28] Indeed, such is the near universal disengagement of institutional fund managers that in the early twenty-first century senior management would appear to be potentially as free to determine corporate strategy as in the 1930s, the decade described by Hannah as "the golden age of directorial power".[29]

In recent years, while a large percentage of UK ownership has been transferred into the hands of foreign investors, this has increased the distance between the board and shareholders, allowing for shareholder passivity to continue.[30] Figure 1 demonstrates how the proportion of shares traded on the London Stock Exchange held by private investors fell dramatically from the early-1960s, reaching just eleven per cent by 2012, while over the same period institutional investors such as mutual funds, insurance companies and pension funds came to dominate. Although one can explain this trend by noting that individuals increasingly preferred to invest their wealth through institutions, as we shall go on to explain the nature of institutional ownership portrayed the same passive characteristics as the private investors of the nineteenth century portrayed by Acheson et al.[31] The growth in foreign ownership of UK listed equities ('Rest of World' in Figure 1) remains primarily institutional in nature, including sovereign wealth funds and performance-driven hedge funds.[32] These crucial changes in corporate activity, ownership and governance in the last fifty years have had significant implications for the network of interlocking directorates, serving to shape the network in interesting ways, as will be discussed below.

Figure 1: Beneficial Ownership of UK equities, 1963-2010



Source: Share register survey report, Central Statistics Office (CSO), 2010.

According to the UK Companies Act 2006, the authority to manage the affairs of the company is vested in its board of directors, while the board usually delegates the authority for day-to-day running of the company to its management[33]. The board has three key functions: management, oversight and service. The lines between these functions are fuzzy at best and over time there has been a shift from boards having an advisory role in the 1970s to a more managerial role in the 1990s, that is determining a company's aims, policies and strategies (for example, approving mergers and acquisitions), with an increasing emphasis on the monitoring role and director independence in the context of persisting corporate scandals and failures in the 2000s.[34] Given these shifts, the board interlock becomes a crucial unit of analysis for wider trends in corporate connectivity, providing us with a novel perspective on trends in British business. Interlocks comprised of directors who sit on more than one corporate board constitute a corporate network, providing incisive insights into the nature of inter-organisational relationships. Interlocks often indicate the presence of a commercial relationship, whether personal or capital in nature, the latter being a relationship typically between shareholders and the company in which they invest.[35] Similarly, interlocking directorates have been widely analysed in the context of corporate strategy, focusing specifically on the impact of outside directors on senior management.[36]

The importance of analysing board interlocks is rooted in both the role of the board as decision-maker and the various roles of directors who linked multiple boards together (known as “linkers”). As a ‘distinctive feature of the corporate form’, boards and links between boards offer an insightful representation of company-to-company relationships and wider corporate structures.[37] As the board has numerous functions, including dictating corporate strategy and monitoring the performance and general decision-making of management,[38] this highlights the significance of studying board interlocks formed by these so-called “linkers”. While previous studies and reports have shown that interlocking directors within their varying positions (non-executive, independent, chairman, etc.) can have an impact on corporate accountability, decision-making and access to resources (in particular, information and external contacts), little work has been done on the way UK interlocks have evolved over recent decades.[39]

In cases where outside directors represent shareholders’ interests, Roberts et al. argued that these individuals should be motivated to take up non-executive board positions, because in doing so this would give them direct access to corporate strategy and potentially allow for efficient monitoring of corporate behaviour, as well as opening a useful line of communication between owners and top management.[40] Given the findings of Acheson et al. regarding the lack of shareholder voting rights in early UK companies, it is possible that board interlocks (whether as non-executives or other forms of "linkers") historically acted as an alternative conduit to corporate control and continue to do so in the current business landscape.[41] At the same time, our examination of the corporate network demonstrates not only the transformation of corporate connectivity over numerous decades, but also the changing composition of board interlocks, potentially isolating boards from contacts which could prove useful, thereby impacting on lines of communication throughout British business. Crucially, arising from the analysis of the corporate network data and supplementary data, it is clear that the position of financial institutions in the British corporate landscape has shifted significantly and the network overall has experienced notable fluctuations in connectivity in response to various market conditions and regulatory changes. This is demonstrated by the decreasing connectivity of the corporate network, as we shall demonstrate below, especially in the case of financial institutions, which have been withdrawing from the core of the UK corporate network in recent decades. Additionally, following major corporate governance code changes and financial crises, there have also been periods of reactionary network reintegration.[42]

Examining the corporate network of interlocking directorates as a whole can thus provide a unique perspective on the presence of these relationships across and within all sectors. Many scholars have adopted this approach for earlier decades. For example, Utton highlights the relationship between clearing banks and the manufacturing sector in the mid-1970s, while Whitley demonstrates the significance of intra-sectoral ties within the financial sector in the same period.[43] Moreover, Cosh and Hughes argued in the 1980s that "this recurring intimacy between relatively small numbers of giant financial and industrial concerns is clearly a significant feature of the contemporary anatomy of corporate control and must be taken into account in assessing trends in the separation of ownership and control and its behavioural implications".[44]

Scott and Griff have also shown that in the 1970s and 1980s the corporate network was comprised of multiple 'groupings' of financial and non-financial enterprises, leading them to conclude that the former were by far the most dominant influence on corporate strategy.[45] Indeed, they claim that "Financial Capitalism" was the abiding characteristic of British business by the 1980s, given the recent transfer of ownership to institutional investors (see Figure 1) and an extensive network of interlocking directorates that apparently vested them with paramount control over the rest of British business.

Although the studies by Scott and Griff and others have provided valuable insights into corporate network structures, the role of traditional financial institutions and the ownership of equity stakes up to the 1980s, it is now timely to readdress the past fifty years of corporate and financial developments. Building on the general approaches suggested by Toms et al. and Garnett et al., this article provides a wider lens through which to view the evolution of corporate connectivity and activity in the UK from the late 1950s. Through the use of corporate network analysis, we can begin to draw important correlations between corporate connectivity, integration, dispersion and reintegration of the network, and what this might suggest regarding patterns of ownership, shifting corporate strategies and the role of various financial players in British business.

Methodology and Dataset

A highly effective method of assessing financial-industrial sector relationships has been through the use of corporate network analysis. A number of studies reveal the efficacy of corporate networks in isolating distinct inter-organisational patterns in business communities across the globe. While many of these tend to focus on the US, the Netherlands and Germany, scholars such as Scott and Windolf have engaged with aspects of the British corporate network.[46] More recently, David and Westerhuis commissioned an extensive analysis of corporate networks across a large number of developed economies, including the UK, providing detailed comparative perspectives to which we will return later.[47] This study of the British corporate network significantly adds to the literature by exploring the British case up to very recent years through the use of network data and network visualisations, which are a useful iterative tool for uncovering both wider trends and pathways for further research. In particular, the article emphasises the importance of examining all financial institutions and their activity within the network, rather than focusing only on commercial banks.

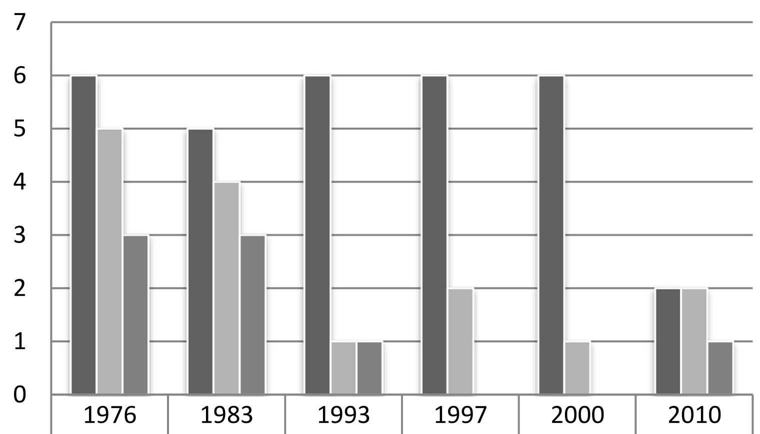
Examining complex inter-organisational relationships as represented by board interlocks has required the creation of a longitudinal dataset detailing the extent of interlocking directorates within the UK's top 250 companies (fifty financial, 200 non-financial, based on net assets) for sample years (1976, 1983, 1993, 1997, 2000 and 2010). The years selected represent distinct phases within British business from the period which followed the 1973 secondary banking crisis and multiple policy changes with regard to the financial sector and corporations in general (1976 and 1983); the period after the 'Big Bang' of 1985 that witnessed growing internationalisation of British business and the first wave of corporate governance codes (1993); followed by a decade of continued corporate governance code reforms (1997 and 2000); and the years following the Global Financial Crisis (2010). The data has been gathered from varied sources such as the Stock Exchange Year Book, Times 1000 list, Thompson One, annual reports, BoardEx and pre-existing datasets.[48] While 250 was the target for sample size, data issues prevented hitting this number of companies for two benchmark years. For example, the 1983 sample was gathered from The Times 1000 which limited the figure for UK based companies to 218.[49] Regardless of this smaller sample, the data offers a sufficient spread across sectors to provide an accurate picture of the top companies in British business for each of the benchmark years. With regards to the spread of the sample over sectors, Table 1 illustrates the varied frequency of sector representation in the sample over the benchmark years, indicating not only the growth and decline of certain types of companies but also waves of sector concentration and consolidation (for example, the decrease in the number of commercial banks).

Table 1. Major sector representation in each of the benchmark years; represented in sample number and as percentages of total sample (based on standard industrial classification of economic activities)[50]

Sector	Standard Industrial Classification (SIC)	1976 (No. in Sample)	1976 (% of total)	1983 (No. in Sample)	1983 (% of total)	1993 (No. in Sample)	1993 (% of total)	1997 (No. in Sample)	1997 (% of total)	2000 (No. in Sample)	2000 (% of total)	2010 (No. in Sample)	2010 (% of total)
Commercial Banks	60	21	8.4	15	6.8	11	4.4	13	5.2	13	5.2	5	2
Insurance and Other Financial	61-67	40	16	29	13.3	39	15.6	37	14.8	37	14.8	44	17.8
Retail and Wholesale Trade	50-59	32	12.8	31	14.2	31	12.4	32	12.8	31	12.4	28	11.3
Transportation, Communications and Utilities	40-49	13	5.2	15	6.8	43	17.2	38	15.2	43	17.2	33	13.3
Construction	15-19	9	3.6	12	5.5	11	4.4	12	4.8	18	7.2	13	5.3
Manufacturing (materials)	30-34	19	7.6	16	7.3	12	4.8	11	4.4	10	4	4	1.6
Manufacturing (equipment)	35-39	33	13.2	28	12.8	24	9.6	19	7.6	22	8.8	22	8.9
Chemicals/Materials	22-26, 28	25	10	18	8.2	29	11.6	27	10.8	18	7.2	14	5.6
Publishing	27	4	1.6	3	1.3	6	2.4	9	3.6	8	3.2	8	3.2
Food, Beverage and Tobacco	20-21	29	11.6	26	11.9	16	6.4	18	7.2	13	5.2	12	4.8
Oil and Gas	13	14	5.6	7	3.2	5	2	8	3.2	6	2.4	17	6.9
Mining	10	4	1.6	3	1.3	2	0.8	3	1.2	5	2	12	4.8
Services (Business, Accounting, Hotel and Leisure)	70-87	7	2.8	15	6.8	21	8.4	21	8.4	26	10.4	35	14.2
Agri/Forestry/Fishing	1	0	0	0	0	0	0	2	0.8	0	0	0	0
Total		250	100	218	100	250	100	250	100	250	100	247	100

Using network analysis software (Pajek), we have constructed network graphs for each of these benchmark years, aiding the analysis of the changing structure, shape and density of the network.[51] Measures of network integration, connectivity and dispersion have proved useful in a multitude of cases and contexts. Many studies have demonstrated the propensity of firms and individuals to form networks in order to gain resources, both tangible and intangible.[52] The shape of a network and the connections forged and broken occur often as a response to changes in the environment. Indeed, examining the network of interlocking directorates over decades provides an excellent tool with which to view many of the broader changes that occurred within the British business (and indeed, global business) environment. Importantly, through the use of actor centrality measures (known as the Freeman degree), it has allowed us to gauge which firms occupied the core and periphery of the network in each sample year. Discovering actor centrality through the Freeman degree, which is the sum of the shortest paths from a singular node, allows the ranking of firms according to their connectedness, the outcome of which reveals how the composition of the core of the network changed over time.[53] For example, Table 2 demonstrates the changing presence of financial institutions (banks, insurance companies and other financials) and especially the dramatic withdrawal of such institutions since the 1980s. The value of the Freeman degree across the benchmark years also provides insights into the relative density of the network for each year, thereby determining the level of integration within the network.[54]

Table 2. Financial Institutions in the top 25 most central companies.



	1976	1983	1993	1997	2000	2010
Commercial Banks and Building Societies	6	5	6	6	6	2
Insurance Companies	5	4	1	2	1	2
Other Financial Institutions	3	3	1	0	0	1

Source: corporate networks dataset.

Other measures, such as firm marginality, isolation and network distance have also been examined in each of the network years. This has provided an indication of the relative distance between firms in the network, the number of firms that held significant intermediary positions and the types of firms that occupied the periphery of the network. Crucially, for each year we have also isolated the links between financial institutions (all types) and the rest of the network. This data provides insights into the frequency of intra-sectoral and inter-sectoral links which could indicate an owner-investee company or advisor/advisee relationship, the potential presence of financial syndicates or cartel-like behaviour, inter-sectoral alliances, and, importantly, how intra- and inter-sectoral relationships shifted over time in response to the changing nature of business in general. Although the analysis of the corporate network enables us to determine the connectedness of particular firms and the overall structure of the directorate network, used in connection with ownership data (see Figure 1) we can draw important correlations between degree of ownership and firm centrality for a given year. This provides crucial insights into shareholder-board interlocks, allowing us to formulate conclusions regarding the level of engagement between the two as patterns of ownership shifted over the period. We can also draw conclusions regarding the impact of overseas investment activity, impact of policy implementation such as the Cadbury Report and network responses to crises, all of which add to our understanding of the various transformations undertaken by the wider British business community in the last half century.

Characteristics of the British Corporate Network

This transformative period for the British corporate network has allowed for the identification of particular trends that are highlighted by the network visualisations described below, as well as network indicators which demonstrate changes in density, centrality and dispersion across the network for all of our benchmark years. These factors provide interesting insights that serve to support the results proposed, specifically that the density of the network changed considerably after 1980. Additionally, this decade in particular marks an important watershed in the relationship between financial and non-financial firms, as well as the position of financial institutions in the network generally. Finally, external environment shifts, such as crises and emerging corporate codes related to non-executive directors, have resulted in important changes in connectivity behaviours throughout the period.

A number of network indicators can provide important insights into the changes outlined. Network density is one network feature that was significantly altered over this period, indicating changes in the nature of connectivity across the network, particularly as it relates to the highly connected and concentrated core of the network. Table 3 details the percentage of firms that were connected in each of the sample years, the percentage of firms which can be denoted as marginal (possessing only one or two links to the network) and the percentage which were isolated (had no tie to the network). Additionally, Table 4 details the number of total linkages in the network for each given year, with 1976 being the year with the most linkages and 1983 being the year with the fewest. Given that the percentage of firms connected to the network was lowest in 1976, but the number of links were the highest of all the benchmark years, this year shows a distinctly dense network overall, particularly at the network core. This feature is also clearly visible from the network diagram (see Figure 3). Through the benchmark years, the network grows significantly more dispersed, with the years following 1997 experiencing a distinct reduction in isolated firms, yet a consistently high number of marginal firms, again demonstrating the spread of the network and the reduction in network density overall.

Table 3. Percentages of connected, marginal and isolated nodes

Year	1976	1983	1993	1997	2000	2010
% of connected firms	75.6	80.9	80.4	90	87.2	91.9
% of marginal firms	21.6	29.76	26.69	25.2	35.2	24.8

% of isolated firms	24.4	19.07	19.52	10	12.8	8.10

Table 4. Number of linkages and Average Degree

Year	**1976**	**1983**	**1993**	**1997**	**2000**	**2010**
Number of total links	542	370	455	519	424	487
Average degree of entire network	4.34	3.44	3.63	4.25	3.39	3.94
Average degree of financial firms	6.84	4.68	2.88	4.38	3.82	3.66

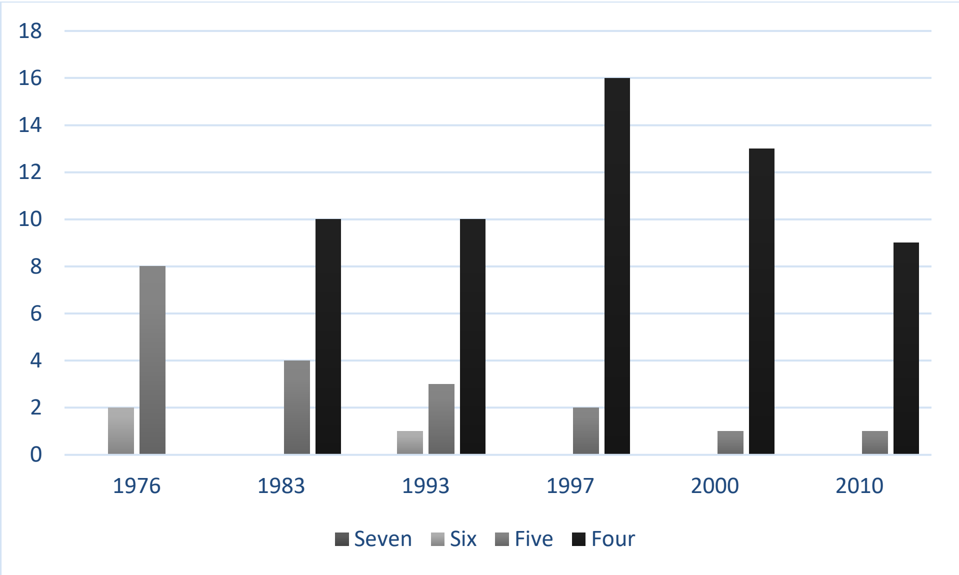
The average degree indicator provides an average number of links for companies in each of the benchmark years. In the years that followed significant shifts in the British business landscape, one can observe a moderate reflective shift in the average degree. For instance, this is especially notable following the crisis years of the early 1970s (1976), the post-Cadbury years (1997) and the global financial crisis (2010). However, if financial firms are isolated from the dataset, their average degree over the years reflects a slightly divergent pattern to the rest of the network for the early years. Up to the mid-1990s, financial institutions on average appear to be receding from the network at a more significant rate than the network average. That said, financial firms also undergo a period of reintegration in 1997, but resume their pattern towards disintegration in the 2000s. This reflects the significant change in the position of financial firms overall in the network over the last sixty years, particularly away from their previously central position in the core of the network. This becomes even more apparent when looking at the top twenty-five companies for each of the benchmark years discussed below.

Table 5. Average distance between nodes

Year	**1976**	**1983**	**1993**	**1997**	**2000**	**2010**
Average Distance	3.26	3.72	3.98	3.86	4.4	4.15

Dispersion in the network over time can also be viewed through the average distance indicator that being the average number of links to move from one node to another in the network. In Table 5, one can detect a notable increase in the average network distance. Taken together with the data on average degree and number of links, this suggests a wider network, where connections between firms are more dispersed, firms are less isolated and there is a general absence of clique-like behaviour. Related to this, our most recent article highlights the presence of what we have referred to as ‘big-linkers’ in the first three quarters of the twentieth century. These were individuals, usually regarded as having a high social status, who possessed multiple board seats; the highest number being seven board seats in 1938 held by two individuals, Lord Essendon and J. B. A. Kessler. For the period under investigation in this article, one can observe in Figure 2 the distinct reduction in positions where over five board seats were held by one person. While an increase in the presence of those holding four board seats is apparent in the late 1990s, by 2010 this number was also significantly reduced.

Figure 2. Number of board seats held by 'big linkers', 1976-2010



These network indicators demonstrate the significant transformation of the corporate network, particularly in the pre-1980s to post-1980s period. Given changes in the financial sector and expectations of boards of directors in the 1980s and 1990s, respectively, these indicators reveal the true impact of shifts in the British business landscape on board connectivity. The following discussion illustrates some of the major changes experienced by the corporate network over the benchmark years in conjunction with more general changes in the British business landscape.

The Corporate Network, 1976-2010

The dataset of inter-locking directorships reveals much about changing corporate connectivity in British business over the period 1976-2010. Our previous article highlighted a number of significant shifts in the pattern of inter-organisational relationships up to 1976 that were visible through an analysis of the corporate network. The corporate network of both pre- and post-war years (1938 and 1958) demonstrated a highly centralised and embedded network, with a denser core to the network dominated by financial institutions. On the other hand, while these institutions remained well-connected at the centre of the network, the percentage of isolated or marginal firms was high (55%).[55] The cartel-like financial clustering evident in the corporate network of 1958 illustrates the inward-looking business environment influenced by a domestic focus in business during this period.[56] Driving much of this behaviour in the period leading up to 1976 were the restrictive lending practices put in place by the government and carried out through the Bank of England.[57] In the following decades, this environment was in perpetual flux, influenced by financial crises, policy changes and changing patterns of ownership, all of which contributed to the rise of new financial players as advisors and intermediaries. In the 1960s and 1970s, as direct private investment declined and individuals began to invest their personal wealth through financial intermediaries, institutional investors became "the protector of the private shareholder", the "supervisor of efficient resource allocation", the "auditor of management efficiency", and at times, simply an investment advisor.[58] As companies searched for greater liquidity in the 1960s, the Stock Exchange and large financial investors and advisors were consequently of much greater importance.[59] In this period leading up to the late-1970s, one can also view a shift in the practices of traditional financial institutions such as merchant banks which were expanding their role as investment advisors to British industry.[60]

Another major influence on the network was the merger waves of the late-1950s and 1960s that resulted in the amalgamation of a number of core British firms, both financial and non-financial. Linked to these changes was a significant shift in ownership of British equities, as outlined in Figure 1, with institutional investors increasing their share to 34.2%, the largest being insurance companies (12.2%), which at times acted on the behalf of pension funds.[61] Most notable amongst the changes in investment practices was the decline in private ownership of UK equity, fundamentally changing the landscape of British business. Changes in the regulatory environment in the late-1960s and the secondary banking crisis of the early-1970s signified the need to reassess the role and freedoms of financial institutions in the British economy.[62] This period led to yet another shift in the British business landscape which impacted on the shape and connectivity of the corporate network in 1976 (Figure 3). In 1976, the network demonstrates growing integration of firms as the overall number of marginal or isolated firms declined significantly from previous years.[63] In the core of the network (Table 6), the presence of financial institutions other than commercial banks had increased, suggesting the growing importance of these institutions in British business during this period, perhaps as a result of their evolving role as advisors and investors.

Figure 3. The British corporate network in 1976

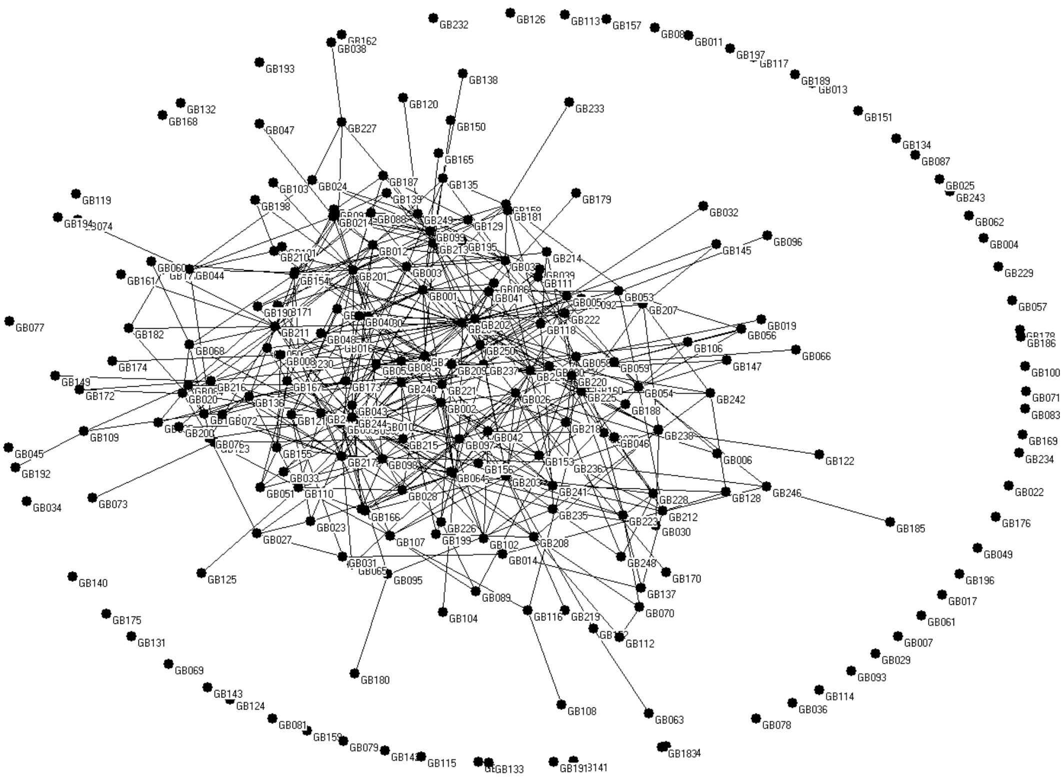


Table 6. Top 25 most central companies in 1976 (according to Freeman Degree)

Company name	**Freeman Degree**
Lloyds Bank	28

Midland Bank	21
British Petroleum	19
National Westminster Bank	18
Barclays Bank	18
Commercial Union	18
Finance For Industry	17
Hill Samuel Group	16
Delta Metal	16
Tube Investments	15
Imperial Chemical Industries	15
Shell Transport & Trading	14
Standard Chartered Bank	14
Rank Organisation	14
Eagle Star Insurance	14
Royal Insurance	13
Guardian Royal Exchange Insurance	13
P & O Steam Navigation	12
Lazard Brothers	11
General Accident, Fire & Life Assurance	11
Lucas Industries	11
Dunlop Holdings	11
British Leyland	10
Fisons	10
Hawker Siddeley Group	10

The change in ownership patterns was widely known by the time of the Wilson Commission report of 1979, which highlighted the distinct move towards ownership of securities by financial institutions such as insurance companies and pension funds. This transfer of ownership arose out of a general preference for owning shares through financial institutions such as unit and investment trusts, as well as a failure by the City to support private investors who had less wealth but were eager to invest in domestic corporations.[64] At the same time, there is little evidence that the accumulation of equity by institutional investors either exerted any influence over merger activity or resulted in the formation of shareholder voting coalitions.[65]

It is apparent from Figure 1 that institutional investors continued their strategy of investing in British business, given that by 1981 they owned over half of all listed UK equities (57.6%) and pension funds had overtaken insurance companies as the largest single category.[66] A complicating factor in this scenario, however, was the 1980 Companies Act, which made it even more difficult for fund managers to access privileged company information, but also created a legal necessity for each to maintain a distant relationship.[67] Increased competition in the financial sector during the 1980s, brought on by de-mutualisation and the extensive incursion of foreign banks, facilitated by the liberalisation of financial dealing, incited institutions to focus on new areas. Banks, for instance, turned their attention to international investments as the market for corporate finance became saturated with 'other financials' and new financial intermediaries.[68]

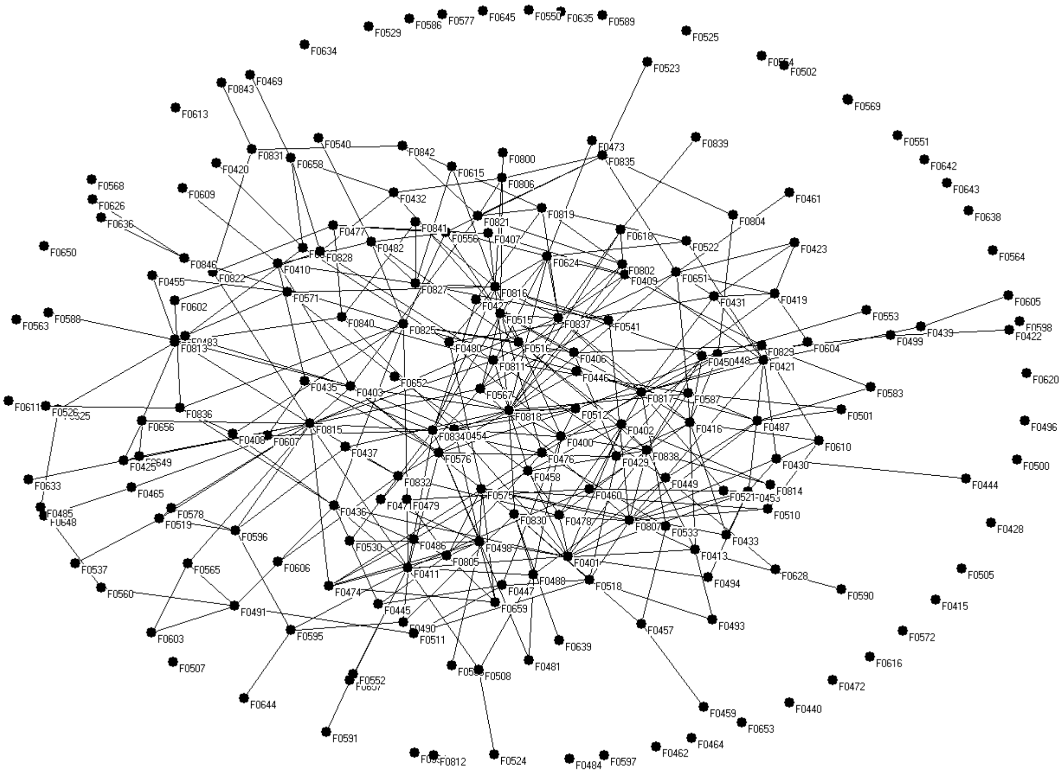
This departure from traditional activities created even greater complexity within the financial sector, while it is also apparent from Table 7 that even before the 'Big Bang' of 1986 the nature of the intercorporate network was changing dramatically, most likely exacerbated by another intense merger wave. Indeed, one can see from Table 7 that by 1983 the average Freeman degree of the firms at the core of the network was much lower than it had been in previous years. This indicates that as many firms were decreasing the number of direct board links they possessed, the network as a whole was much less dense and the distances between firms was increasing, creating a much more dispersed network (see Figure 4). However, while the core of the network was noticeably less dense, the number of firms connected to the network increased to 81% (up from 75% in the previous benchmark year). This trend is linked to the rising number of marginal firms (with only one or two connections to the network) which by 1983 made up 30% of the network overall. While financial firms were still at the core of the network and ‘other financials’ continued to increase their role as shareowners of non-financial companies, the network was far less concentrated than it had been in previous years (see Table 6). Above all, this can be linked to the shifting focus of financial institutions, creating greater dispersion amongst inter-sectoral links, which if we consider instances in which financial institutions were shareholders in British business and combine this with an evidenced preference for short-term results, suggests that the implementation of long-term relationships between boards and shareholders was no longer possible. The increased distance between financial and non-financial institutions could have been exacerbated by many firms turning their focus towards international investment activities, giving rise to the much greater frequency of ‘faceless’ interactions facilitated by the use of new technologies.

Table 7. Top 25 most central companies (based on Freeman degree), 1983

Company name	**Freeman Degree**
Lloyds Bank	20
Barclays Bank	18
Rio Tinto-Zinc Corporation	14
Hill Samuel Group	13
Midland Bank	13
National Westminster Bank	13
Sun Alliance & London Insurance	13
'Shell' Transport & Trading	12
Royal Insurance	12
British Petroleum Co.	11
Eagle Star Holdings	11
Blue Circle Industries	10
Imperial Chemical Industries	10
Standard Chartered Bank	10
Chloride Group	9
London & Scottish Marine Oil	9
Westland	9
Allied-Lyons	8
B. A. T. Industries	8
Inchcape	8
John Brown	8
THORN EMI	8
Kleinwort, Benson, Lonsdale	8

Legal & General Group	8
Beecham Group	7

Figure 4. The British corporate network in 1983



Alongside these trends, intra-sector links involving financial institutions were changing. Non-monetary financial institutions, while still connected to many of the big banks, were moving away from these financial players. For example, Hill Samuel Group and Eagle Star Holdings were connected mainly to industrial companies, apart from a small number of investment trusts and insurance companies. Although these financial institutions retained good inter-sectoral links, with only a small group of firms (with a Freeman degree of less than two) favouring ties to other financials (only four retained no ties to the network), it is clear that the financial cartel of the 1950s had disappeared.[69] Furthermore, the network was more dispersed, with 'other financials' diversifying their links more extensively in order to protect their investments.

While the growing concentration of ownership by financial institutions had the potential to allow for cohesive corporate coalitions and greater shareholder influence over corporate behaviour,[70] the growing dispersion of the network potentially reflects the increasing disconnect between shareholders and boards, and that, despite the potential for greater communication between shareholders and boards, the expected power shift into the hands of investors did not occur[71]. Alongside the more obvious barriers such as dispersed share ownership and the associated problems of co-ordination, management and control; other problems such as free-riding, diversification, long chains of intermediation, rational apathy and informational deficit have also been highlighted as reasons for investor passivity.[72]

Moreover, the deregulation of the London Stock Exchange in the mid-1980s provided foreign financial institutions with much greater access to the City of London, providing new cash flows for investment, both domestically and internationally.[73] The clearing banks especially shifted the focus of their strategies from domestic to global markets, a point substantiated in Table 8, which highlights how the centrality of the clearing banks declined by 1993, while Figure 5 illustrates how the trend towards a dispersed network continued. Table 8 reveals that while Barclays retained the same degree centrality as in 1983, the number of financials at the core of the network was decreasing significantly (see Figure 5). This continued withdrawal of financial institutions from the network could be a representation of the lengthening investment chain that drew shareholders and boards further apart, effectively leaving senior executives in control of their respective companies.

Figure 5. The British corporate network in 1993

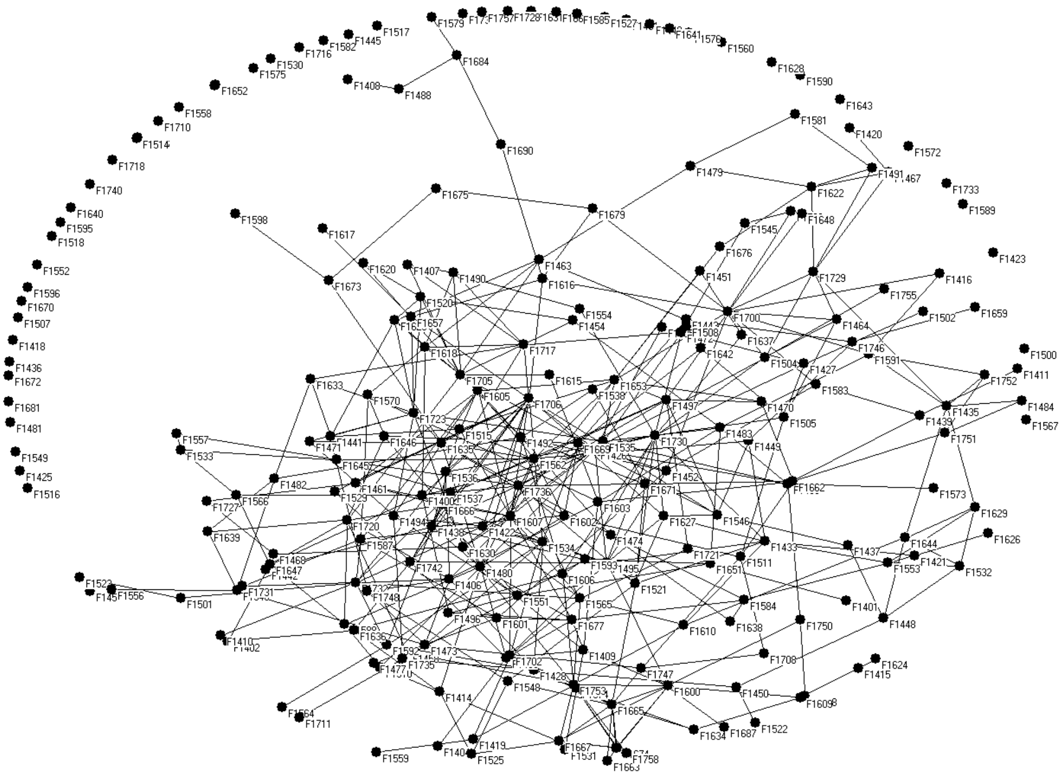


Table 8.Top 25 most central companies (based on Freeman degree), 1993

Company name	**Freeman Degree**
Barclays PLC	18
Rio Tinto PLC	16
Legal & General Group PLC	15
De La Rue PLC	13
Abbey National PLC	13
Trafalgar House PLC	12
Bank of Scotland PLC	12
BAA Airports, Ltd.	11
English China Clays PLC	11
Lucas Varity PLC	11
Unilever PLC	11
HSBC Holdings PLC	11
Standard Chartered PLC	11
Imperial Chemical Industries PLC	10
Smithkline Beecham PLC	10
The BOC group LIMITED	10
Lloyds Banking Group PLC	10
AstraZeneca PLC	9

Rank Group PLC	9
3I Group PLC	8
Alliance Boots PLC	8
BET PLC	8
BP PLC	8
Eurotunnel PLC	8
Hanson, Ltd.	8

In highlighting these characteristics of the 1990s corporate network, it is clear that the business environment was undergoing yet another change, given that by 1992 institutional investors owned 60.6% of UK equities. Furthermore, financial institutions had significantly decreased their presence at the core of the network, which could reflect the growing distance between executives and owners as shareholder roles were increasingly occupied by portfolio investors both in the UK and abroad.[74] It can therefore be hypothesised that the 1980s changes in corporate strategy and structure, such as increased divestment of subsidiaries by multidivisional corporations, shifting patterns of ownership and an emerging era of corporate governance codes, all played a role in changing both the shape and connectivity of the corporate network.[75] Regardless of this renewed focus on corporate governance, however, the largest owners of industrial concerns continued their detachment from the network, which in 1993 contained the greatest number of 'other financials' with no ties to other firms. It is clear from the network data that while the level of integration versus dispersion was much the same as in 1983, when financial institutions' ties are examined, they reveal much greater change. The syndicated nature of finance seen in the 1950s-1960s was clearly at an end for banks, which possessed far more links to industrial firms and were often only linked to one other financial, a trend carried on from 1983. While this could suggest a positive inter-sectoral relationship, it is clear from past decades that intra-sectoral connections provided much needed support and monitoring amongst the financial sector. That said, many boards of financial institutions other than banks with connections to fewer than three other boards maintained only intra-sectoral ties, a dispersion trend that is illustrated in Figures 5 and 6.

Figure 6. The British corporate network in 1997

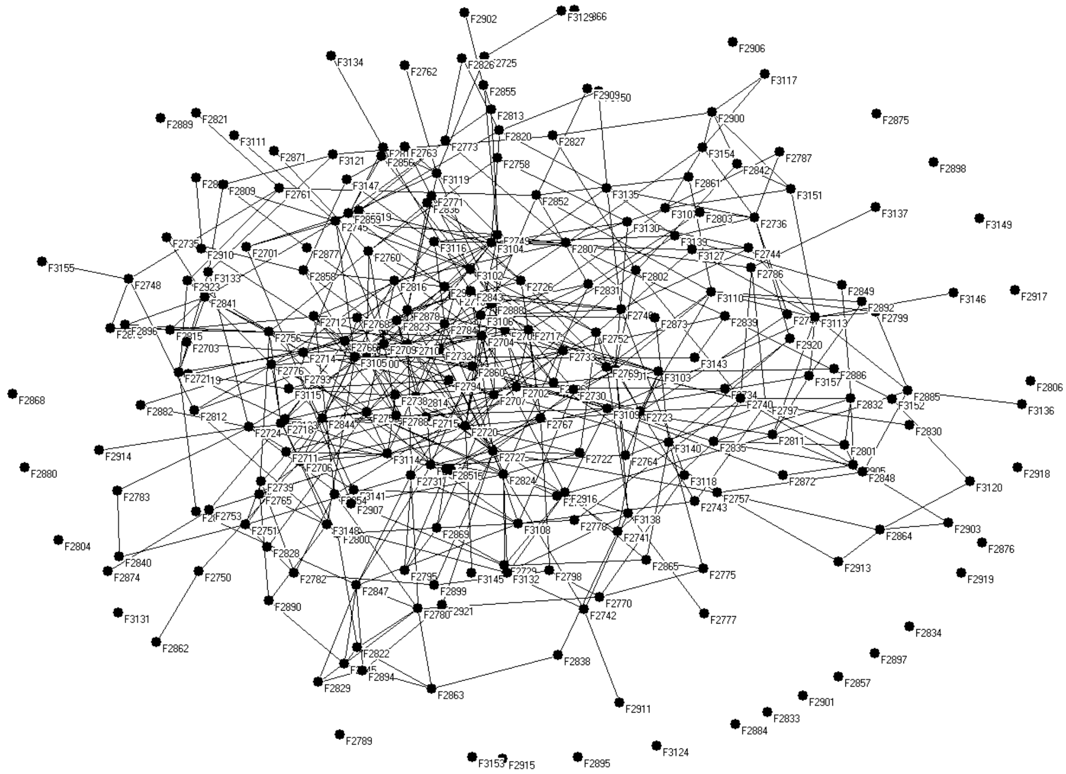


Table 9.Top 25 most central companies (based on Freeman degree), 1997

Company name	**Freeman Degree**
National Westminster Bank PLC	14
Marks & Spencer Group PLC	14
M (2003) PLC	13
British Airways PLC	13
HSBC Holdings PLC	13
Barclays PLC	12
Standard Chartered PLC	12
Intercontinental Hotels Group PLC	12
Bank of Scotland PLC	11
Diageo PLC	11
Alliance Boots PLC	11
Reuters Group PLC	11
Uniq PLC	11
Inchcape PLC	11
Rio Tinto PLC	11
Rank Group PLC	10

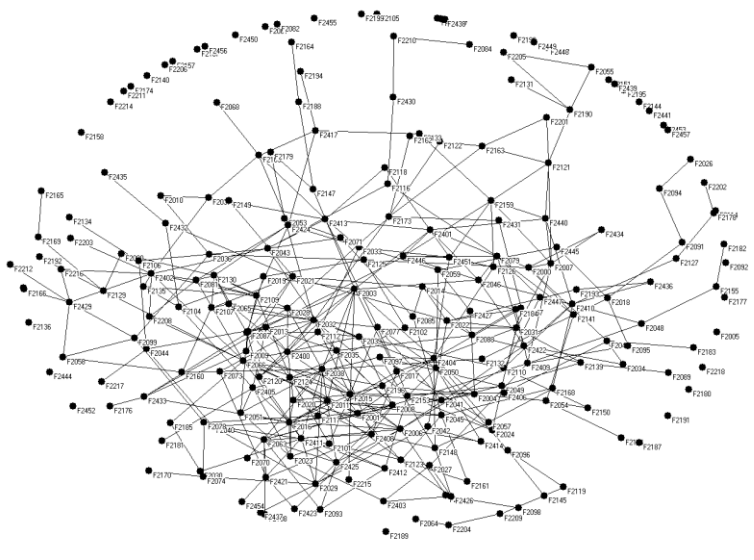
BP PLC	10
BT Group PLC	10
Tesco PLC	9
EMI Group, Ltd.	9
Unilever PLC	9
RSA Insurance Group PLC	9
Prudential PLC	9
Abbey National PLC	9
Imperial Tobacco Group PLC	9

Influenced by numerous corporate scandals,[76] stock market manipulations and the behaviour of directors in some large corporations, a series of reports and committees advocated the need for a closer relationship between executives and owners.[77] An interesting change in the network between 1993 and 1997 reflects an important response towards these recurrent corporate governance issues and policy changes. The most noticeable of these was the 1992 Cadbury Report, which urged boards to ensure greater accountability to shareholders in order to fulfil their fiduciary duty and ensure shareholders could exert control over their investee companies.[78] The Cadbury Code also sought to define more clearly the roles and responsibilities of non-executive directors as monitors of corporate behaviour, exerting a general need for a greater presence of such non-executive directors on company boards.[79] Conyon and Mallin found that there had been substantial compliance to the Cadbury Code by the late-1990s,[80] a trend further illustrated by the reduced density of the UK corporate network (see Figure 6). The network in 1997 reached a high level of integration (significantly higher than in the previous benchmark years), with 90% of all firms retaining a tie to the network, suggesting that the practice of inter-locking through outside directors was more prevalent *across* the network and not a just a practice undertaken by a few key firms and individuals. While the number of marginal firms still occupied a large category (25% of firms), the number of completely isolated firms was dramatically lower. The number of total links in the network was also at its highest, but dispersed amongst the network, creating greater distance in the network and a less dense core, yet overall more integration.

In terms of the financial sector, while bank ties in this year retain much the same composition as in 1993, changes to financial institutions other than banks were more pronounced. The impact of changes in policy on the position of 'other financials' was such that by 1997 the number of these firms with no tie to the network had fallen to just three. While the network itself was widening and less concentrated at its core, meaning more companies were linked to the network but fewer companies possessed multiple board connections, it is clear that there was a concerted effort amongst many financial institutions to re-integrate themselves into the network and increase their ties to non-financial firms. For example, Manchester & London Assurance group, which in 1993 had no links to the network, by 1997 had five, most of which were non-financials (other than Segro PLC). Schroders, an important asset management and advisory firm, also increased its links within the network from three to five. Additionally, by 1997 Prudential PLC, whose investment arm, Prudential Portfolio Managers Ltd., had been the second largest manager of UK equities in 1991, was linked only to industrial concerns. Large fund managers of the 1990s such as M & G group and Sun Life, neither of which appeared in the 1993 network, were well integrated by 1997. The growth and consolidation of firms such as M & G group was indicative of a move toward a re-concentration of ownership. This strongly suggests that the poor corporate behaviour of the 1980s and the growing detachment of shareholders from their investee company boards had provoked both corporate governance reforms and some decisive movements within the network by 1997, even if the former were undertaken largely in the interest of protecting shareholders and little mention of changes to boardroom behaviour and general business ethics was made.[81]

Over the course of the next decade, the financial sector continued to grow more complex. Although the network appeared to respond positively to policy shifts in 1997 through greater integration, by 2000 the network was becoming increasingly dispersed, with a greater number of firms wholly disconnected (albeit not to the degree reached in 1976, 1983 and 1993, the years when the percentage of isolated firms was highest). One possible explanation of the increased network dispersion in 2000 could be the emphasis on director independence within the developing UK Corporate Governance Code.[82] In this year, nearly half of all firms are either marginal or isolated, suggesting in some cases a growing distance between boards, perhaps exacerbated by growing distance between owners and investee companies. Although the concentration of ownership in the hands of British financial institutions decreased from the mid-1990s and share-ownership generally became more dispersed amongst both domestic and international investors, this era witnessed a burgeoning of financial intermediaries and the lengthening of an investment chain that was already attenuated.[83] These developments served to weaken even further the link between investors and their portfolio companies,[84] even though building on what the Cadbury Code first introduced, the Higgs Review (2003) highlighted the growing significance of the non-executive director role in corporate governance.[85] Regardless of this change, however, the corporate network trends of the 1990s continued into the 2000s. In particular, it is apparent that the network widened over this period (see Figure 7), with a significant decrease in the number of links between firms, albeit not returning to pre-Cadbury levels in terms of disconnection.

Figure 7. The British corporate network in 2000.



It is first of all apparent from Table10 (see also Figure 7) that financial institutions in the network had moved even further away from the core. A second characteristic of the network in 2000 was its compartmentalised nature, with a greater number of clusters emerging that were set apart from the larger network, as well as firms connected through a chain of singular, rather than multiple, integrated links. This was significant in that companies had fewer lines of communication within the network, thereby reducing both the extent of interaction between boards and the level of integration. Indeed, the average distance between firms continued to increase; despite more firms being connected, the path from one firm to the next was on average longer.[86] This reflected the complicated inter-organizational relationships emerging in this decade, a scenario precipitated by a combination of new governance codes and the increased complexity of the financial sector. By 2000, non-monetary financial institutions had all but disappeared from the Top 25 most central companies (see Table 10), potentially illustrating the continued dispersion of share ownership amongst financial institutions, individuals and foreign investors. Beneficial ownership of UK equity by institutional investors had fallen to just under 50% by 1998, a trend that continued into the twenty-first century.[87] The decrease in the average degree centrality of the network and the withdrawal of financial institutions from the core of the network meant that for the first time in the dataset, three non-financial companies occupied the position of most central in the corporate network (see Table 10). While banks continued to be well-connected in the network, their centrality had also been reduced significantly by the 2000s, illustrating once again a decline in the influence they could potentially have exerted over corporate strategy.

Table 10. Top 25 most central companies (based on Freeman degree), 2000

Company name	**Freeman Degree**
British Airways PLC	15
Invensys PLC	14
BT Group PLC	12
Lloyds Banking Group PLC	12
Cable & Wireless Communications PLC	11
Rio Tinto PLC	11

Rolls-Royce Holdings PLC	11
ALLIANCE BOOTS PLC	11
Barclays PLC	11
Standard Chartered PLC	11
BP PLC	10
Glaxosmithkline PLC	9
REUTERS GROUP PLC	9
HSBC Holdings PLC	9
Bank of Scotland PLC	9
M (2003) PLC	8
Marks & Spencer Group PLC	8
Trinity Mirror PLC	8
Rank Group PLC	8
NOVAR PLC	8
Royal Bank Of Scotland Group PLC	8
Prudential PLC	8
Anglo American PLC	7
Tesco PLC	7
Compass Group PLC	7

One of the more powerful explanations for these trends was that despite a continued focus on corporate governance issues by a succession of committees, introducing stricter governance guidelines on corporate monitoring that had the potential to impact on the frequency of outside directors on corporate boards, other factors such as increasing global integration and riskier financial activity caused the network to be drawn apart once again.[88] As a result of these developments, the concentration of ownership declined, suggesting that developments in corporate governance policy and the financial landscape in general continued to influence the nature of ownership in British business.[89] Even though financial institutions continued to be significant owners of British business, their withdrawal from the corporate network serves to corroborate the empirical evidence that shareholders in the twenty-first century continued to exert limited influence over their portfolio companies. This characteristic was further exacerbated by the enormous influx of foreign investors ("Rest of World" in Figure 2) from the 1990s. Crucially, executives remained largely in control of decision-making and strategy, while investors continued their arms-length approach, operating mainly through an array of intermediaries who prioritised short-term returns on investments

Despite fluctuating dispersion in network connections through the late-1990s and early-2000s, the global financial crisis of 2007-08 caused yet another dramatic shift in the corporate network. As Figure 8 and Table 11 reveal, by 2010 there had been a re-integration of the network as a whole. In this year, the network reached the highest percentage of integrated firms overall in all benchmark years, along with a low number of marginal firms and an even lower number of isolated firms (only 8.1% of all firms). The number of total ties between firms also increased, indicating an increased density in the network overall. Although banks appear to be continually losing their networked position in this period, the activity of banks such as Barclays and Lloyds suggests a move towards greater intra-sectoral links, perhaps motivated by a need to protect the banks that remained active after the crisis. On the other hand, the position of financials as the most central companies in the network continued to decline in the 2000s (see Table 2). For banks especially, the crisis had a detrimental effect on their position in the network: while the percentage of UK equity ownership by banks had been increasing, reaching an all-time peak of 3.5 % in 2008,[90] by 2010 this had fallen to 2.5%, largely as a result of changes to banks' investment activities in the wake of the crisis.[91] For example, RBS sold off its stake in Direct Line, and similarly Lloyds sold off part of its stake in St. James Place, significantly reducing the bank's investment activity in Britain. The position of other financial institutions also changed in this period, as a number of them returned to the core of the network. For example, firms such as Segro and RSA insurance joined the Top 25 most central companies, while Prudential retained its degree centrality with a Freeman degree of 8. This trend can be partially explained by the increased emphasis on environment, social and governance factors, as well as corporate social responsibility,[92] and a move towards responsible investing that was articulated through an increase in corporate connectivity. This lead to greater corporate monitoring within the network as part of an immediate reaction to crisis, similar to that which was seen in 1976. With foreign investors accounting for a much-increased proportion of UK equities – "Rest of the World" in Figure 2 rose from 3.6% in 1981 to 24% in 1997, reaching 41.2% in 2010 - this displaced much of the share-ownership by UK financial institutions which by 2010 had fallen to 38.5 % (excluding banks).[93]

Figure 8. The British corporate network in 2010

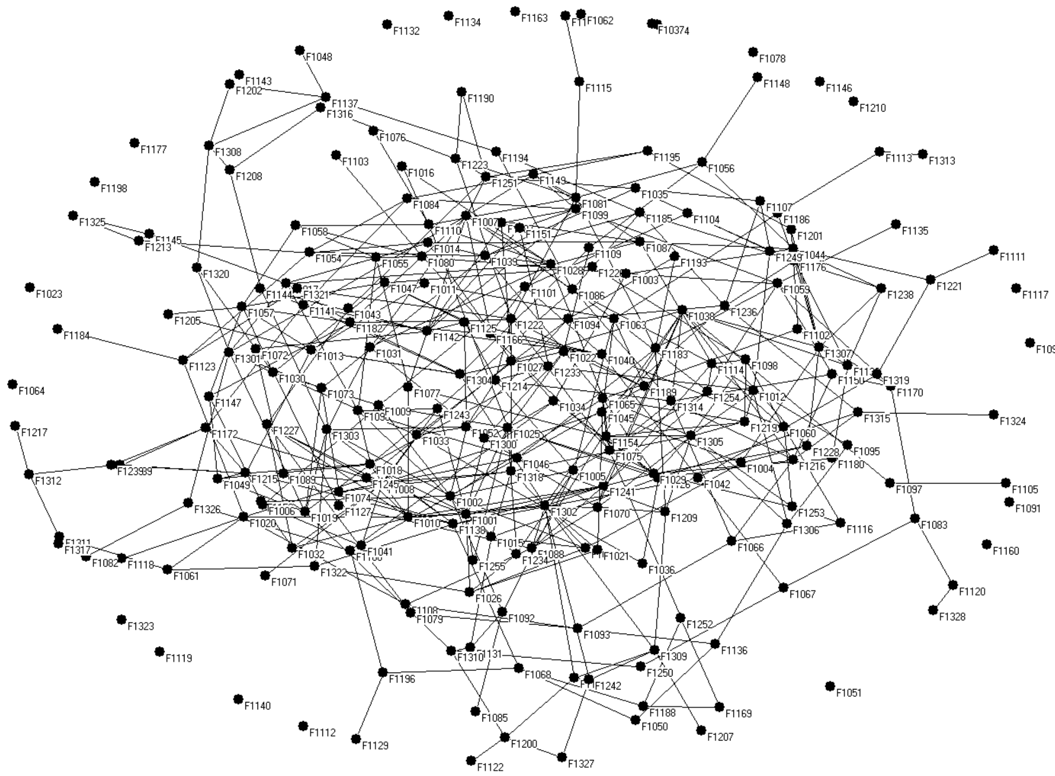


Table 11. Top 25 most central companies (based on Freeman degree), 2010

Company name	**Freeman Degree**
National Grid PLC	14
WM Morrison Supermarkets PLC	11
Tesco PLC	11
J Sainsbury PLC	11
BP PLC	11
Standard Chartered PLC	11
Royal Bank of Scotland Group PLC (the)	11
Experian PLC	10
Rolls-Royce Holdings PLC	10
Reckitt Benckiser Group PLC	9
BAE Systems PLC	9

Anglo American PLC	9
Reed Elsevier PLC	8
Unite Group PLC (the)	8
IMI PLC	8
DS Smith PLC	8
Halfords Group PLC	8
Segro PLC	8
Johnson Matthey PLC	8
Home Retail Group PLC	8
Vodafone Group PLC	8
RSA Insurance Group PLC	8
Prudential PLC	8
Intertek Group PLC	7
Arm Holdings PLC	7

The increased level of foreign investment in British corporations has had an astounding effect on corporate connectivity. With the influx of foreign investor companies, most of which were institutional investors, interlocks as a method of corporate monitoring within the corporate network became even more difficult. Similarly, the increased emphasis on board independence originating with the 1992 Cadbury Code was further developed through various iterations of the Combined Code of Corporate Governance introduced in 2003. This, together with the increased internationalisation of business and a decrease in clique-like behaviour amongst a group of well-connected directors that was visible in earlier benchmark years reduced the propensity to build corporate networks through board interlocks. Coupled with a standardized reduction in board size from the 1990s, it became even more difficult for British financial institutions to influence corporate decision-making through board representation. The close-knit corporate network of the 1950s, although less monitored than in recent decades, possessed open lines of communication between boards, giving investors and outside stakeholders the opportunity to influence company strategy and performance. The decline in intra-sectoral links prevalent in the financial sector before the 1990s also indicated an important shift away from the 'self-regulatory' environment which perhaps at times provided much needed support, monitoring and advice to financial and non-financial institutions. What Scott and Griff described as the 'financial control' of British business in the

1980s was never realised in later decades.[94] The absence of a shift in power into the hands of institutional investors, despite the concentration of ownership by financial institutions up to the 1990s, meant that boards and executives were left to run companies, while institutions merely waited for returns on their investments. Into the twenty-first century, the continued control by executives was further demonstrated through the activity and decisions of remuneration committees.[95]

The withdrawal of financial institutions from the network and the overall decline in corporate connectivity in recent decades suggests a number of interesting trends related to the degree of communication within and between sectors.[96] The dispersed structure of the current network of interlocks seen in Figure 7 and the involvement of a greater number of foreign owners has significant ramifications for the structure and board-level activity of British firms, especially as it pertains to instances in which financial institutions represent shareholder interests. However, it is questionable whether this marks the beginning of a re-integration of certain types of financial institutions into the core of the network, indicative of the beginnings of a reinstitution of financial control over British boards, or simply a temporary reaction to new codes of practice and the aftershocks of a global financial crisis. One might note, though, that such were the conclusions of The Kay review (2012), the Ownership Commission (2012), as well as the most recent study into the effectiveness of the UK asset management industry by the UK Financial Conduct Authority (2016) relating to the deep level of disengagement by institutional investors and their continued preference for high-frequency trading, that little would change.

Conclusions and implications for further research

While our previous article on finance-industry relationships on the earlier part of the twentieth century demonstrated shifts in bank amalgamations, connectivity and inter-sectoral ties, this extension of the corporate network analysis further articulates the continual transformations to the British financial sector and indeed the British business landscape as a whole up to 2010. Using an original and comprehensive dataset on the directors of the Top 250 British companies over the period 1976-2010, it has been possible to generate both revised views of the UK's corporate network and contribute to emergent literatures relating to the evolution of corporate governance in the UK, changes within the British financial sector and developments within finance-industry relationships in the last few decades. This article has also provided a fresh perspective for viewing wider trends and has elaborated on the work of John Scott and Paul Windolf by stretching such methods into the late twentieth and early twenty-first centuries.[97] In particular, we identify a distinct change in the role of British financial institutions in British business in recent decades. This suggests a number of interesting conclusions: given the increasing role of financial institutions in UK equity ownership from 1960, the withdrawal of financial institutions from the network suggests a growing disconnect between owners and boards, a feature which can only be fully appreciated through visualising the corporate network. Additionally, major changes in the business landscape related to policy and crises appear to have resonated in the network itself, demonstrating reactive corporate interlocking behaviour amongst the largest businesses in Great Britain.

Although space limitations prevent us from indulging in a comparative analysis of corporate networks across developed economies, it is useful to link the work on the British scene with the detailed research collected together by David and Westerhuis.[98] It is especially noticeable that just as in the UK, corporate networks were eroded from the 1980s, largely as a result of both tighter regulation and the nature and impact of globalisation, especially when linked to the liberalisation of financial markets. Of course, the comparative perspective is much more nuanced, but the reduction in board size and declining presence of 'big linkers' would also appear to have been significant trends across many economies. These extremely valuable insights reinforce our claim that much more detailed research into domestic and international corporate networks would provide further depth to the analysis of what in the last 150 years have been consistent features of the business scene.

Returning to the British case, apart from what recent developments in the corporate network suggest about the current state of British inter-corporate relationships, we can reiterate the three observations offered at the start of this article. Firstly, it is apparent from our research that by the 2000s British corporate networks were much less dense than they had been up to the 1980s. Secondly, this highlights the different stages through which UK corporate networks evolved between 1976 and 2010. While up to the 1980s financial institutions were acquiring a significant number of corporate board directorships in both financial and non-financial firms, thereafter they withdrew from the corporate network. This trend could be explained by a combination of extended corporate governance regulations that imposed tighter controls on cross-company interaction and reduced board size, alongside the pursuit of global strategies that took financial institutions away from the previous preference for British shareholdings. Thirdly, the 1980s marked a decisive watershed in the relationship between financial and other sectors, radically altering the perception of UK corporate networks that had been generated up to that decade.

Above all, this research presents a novel perspective on changing relationships between Britain's largest companies over the last half-century, one that confirms the periodic transformational nature of corporate activity in Britain through distinct shifts in the structure and composition of corporate connectivity, a trend identified by Hannah regarding British business in the first half of the twentieth century.[99] While much more work needs to be done on the relationship between corporate connectivity and power potential, it is apparent that by using the corporate network lens one can evaluate the effectiveness of policy and varied regulatory environments, as well as responses to crucial external shifts in the economy and wider corporate strategy.[100] At the same time, it is worth adding that much greater research is required at a micro- case-study level in order to comprehend fully the relationship between boards, and especially as it relates to investors and managers, providing a challenge that will result in an improved understanding of the dynamics of British business over this period. By building a foundation on which one can identify major shifts, industry anomalies and the changing networked position of particular categories of firms, this study has highlighted important perspectives that warrant further investigation. For instance, the changing position of financials suggests that changes in foreign ownership and increasing global financial connectivity has had a direct impact on corporate connectivity in British business, illustrating how the network can be utilised to identify firms influenced by such shifts. Finally, the move towards reintegration seen in both 1976 and again in 2010 suggests a wider response to crises that can only be fully appreciated through visualising the corporate network.

Further research into the impact of crises on the corporate network and interlocking behaviour would also reveal much regarding inter-organisational relationship strategies, especially if this was more extensively linked to the comparative work of David and Westerhuis. While the authors acknowledge the limitations of the study, in so far as one can observe the changing patterns of interlocks over a significant period of British business, but not necessarily the impact of individual links between firms in the network, this study lays important foundations for recognising potentially significant relationships within and between industries, as well as individual firms. This research can also suggest some interesting hypotheses that might be more fully realised through micro-level research, especially as it pertains to the continuing disconnect between company boards. Through the corporate governance literature and now the revealed dispersion of financial institutions within the corporate network itself, one can find little evidence to support the claim that “New Financial Capitalism” had come to dominate British business. While one can accept that decision-making on boards of directors is still predicated on shareholder primacy, or “financialization” strategies, those who owned the bulk of UK equities failed to engage much in the determination of generic corporate strategy, allowing senior executives to continue to dominate decision-making and determine their remuneration packages. This study provides significant conclusions about macro-trends in corporate connectivity since the 1970s, as well as providing direction for future research by highlighting potential case studies within a wider context, revealing further intricate detail regarding changes to the British business landscape.

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1. Wilson, Buchnea & Tilba, "British Corporate Network", 1-28.

2. Scott and Griff, *Directors of Industry*; Scott and Griff, 'Bank Spheres of Influence', pp. 1-19.

3. Scott, *Corporate Business;* Froud et al., *Financialization and Strategy*.

4. Hannah, *Rise of Corporate Economy*, pp. 90-91; 143-156.

5. Toms et al. "The evolution of private equity," 736-68.

6. Pettigrew and McNulty, "Power and influence in and around the boardroom", 845-873.

7. Rubio-Mondéjar and Garrués-Irurzun, "Economic and social power", 1-22; Scisani and Caiazzo, "Networks of Power", 207-243; Del Angel, "Nexus between business groups", 111-128; Wilson, Buchnea & Tilba, "British Corporate Network", 1-28; Scott and Griff, *Directors of Industry*; Scott and Griff, 'Bank Spheres of Influence'; Mizruchi, "What do Interlocks Do?" 271-98; Mintz and Schwartz, "Financial Interest Groups", 183-204; Scott, "Corporate control and corporate rule", 351-373; Windolf, "Coordination and Control," 443-57; Fohlin, 'The rise of interlocking directorates in Imperial Germany,' 307-333; Robins and Alexander, "Small worlds among interlocking directors," 69-94;

8 Scott and Griff, *Directors of Industry*; Scott and Griff, 'Bank Spheres of Influence'; Mizruchi, "What do Interlocks Do?" 271-98.

9. Roberts, "Regulatory responses to the rise of the market for corporate control", 183-200.

10. It is essential to emphasise that the firms analysed exclude foreign multinationals. The dataset is described and analysed in Schnyder and Wilson, 'The Structure of Networks', pp. 48-65.

11. A number of studies have highlighted the correlation between shareholder influence and board interlocks. See Scott and Griff, *Directors of Industry*, p. 17; Rosenstein and Wyatt, "Outside Directors, Board Independence," 175-91; Cai and Sevilir, "Board Connections", 327-49 and Gulati and Westphal, "Cooperative or contolling?" 473-506.

12. Larson et al, 'Strategic responses to European integration' 40-62.

13. Davis, "A new finance capitalism?" 11-21; Jackson, "A new financial capitalism?" 23-26.

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16. Garnett et al. "Complexity in history," 182-202.

17. Toms et al, "The evolution of private equity", 736-68.

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27. Haldane, 'Who owns the company?' 11-12.

28. Karpoff et al., "Corporate Governance," 365-95; Duggal and Millar, "Institutional Ownership," 103-17; Romano, "Less is More," 174-251; Kahan and Rock, "Hedge Funds in Corporate Governance," 1012-93. Bushee, "The influence of Institutional Investors," -33; Conyon and Sadler, "Shareholder Voting," 296-312; Tilba and McNulty, "Engaged versus Disengaged Ownership," 165-82.

29. Hannah, "Takeover bids in Britain," 65-9.

30. Zetzsche, "Shareholder Passivity," 289-336

31. Acheson, Campbell and Turner, "Active Controllers", 661-691.

32. Dahlquist and Robertsson, "Direct foreign ownership," 413-440.

33 Section 172 of the Companies Act 2006 provides that a director must act in the way he considers, in good faith, would be most likely to promote the success of the company for the benefit of the members as a whole.

34. Bainbridge, *Corporate Governance after the Financial Crisis*

35. Scott and Griff, *Directors of Industry*, p. 17.

36. Mizruchi, "What do Interlocks Do?" 271-98.

37. Nordberg & McNulty, Creating better boards' 348-74.

38. Bizjak, Lemmon and Whitby, "Option Backdating", 4821-4847; Hendry and Kiel, "The Role of the Board", 500-520.

39. Cadbury Report, 1992; Higgs Review, 2003; Cosh an Hughes, "Anatomy of Corporate Control", 285-313; Pass, "Corporate Governance", 52-63; Haunschild and Beckman, "When Do Interlocks Matter?" 814-855.

40. Roberts, McNulty and Stiles, "Beyond Agency Conceptions", S5-S26.

41. Acheson, Campbell and Turner, "Active Controllers or Wealthy Rentiers?" 661-691.

42. To some extent, while this article is not designed to test the relative efficiency of boards, board size also plays a role here as its standardization and composition since the 1990s has impacted upon the density of the corporate network.

43. Utton, *The Political Economy of Big Business*, p. 32; Whitely, "Commonalities and connections", 613-632.

44. Cosh and Hughes, "Anatomy of Corporate Control," 285-313; Given investor disengagement and short-termism, one must question whether these types of relationships were ever of significance in determining corporate strategy. Aguilera argues that the historical relationship between shareholders and boards of directors has largely been ignored due to the passive role of institutional shareholders towards corporate decision-making. In the 1970s, Briston and Dobbins predicted that continued investment by financial institutions in industry would draw fund managers much more into managerial problems, thus creating a necessity for investor activism. Recently, Foreman-Peck and Hannah and Acheson et al. have argued that investor disengagement has been a feature of British business since the Victorian period owing to the dispersion of share ownership within most industries (Breweries excepted). Foreman-Peck and Hannah, "Extreme Divorce," 1217-38; Acheson et al., "Corporate Ownership and Control," 911-36; Aguilera, "Corporate Governance," 39-53; Briston and Dobbins, *Institutional Investors*.

45. Scott and Griff, *Directors of Industry*, pp. 171-3; Scott and Griff, 'Bank Spheres of Influence', pp. 1-19.

46. Mizruchi, "What do interlocks do?" 271-298; Mintz and Schwartz, "Financial Interest Groups", 183-204; Scott, "Corporate control and corporate rule", 351-373; Windolf, "Coordination and Control," 443-57; Fohlin, 'The rise of interlocking directorates in Imperial Germany,' 307-333; Robins and Alexander, "Small worlds among interlocking directors," 69-94; Windolf and Beyer, "Co-operative capitalism," 205-31; Scott and Griff, *Directors of Industry*.

47. David and Westerhuis (eds.). *The Power of Corporate Networks*.

48. The data for 1976 has been obtained from a dataset compiled by F. N. Stokman. The 1983 sample was compiled using the Times 1000 list and corresponding director data from the Stock Exchange Yearbook. The data for 1993 has been gathered from Thomson One according to whitepaper definitions, i.e. the top 200 non-financials and top 50 financials by total assets. The data for 1997 and 2000 was provided by a dataset compiled by M. J. Conyon in conjunction with director data from BoardEx. The 2010 financials and non-financials sample was defined using Bureau van Dijk's OSIRIS database of publicly listed firms, as well as BoardEx for specific director data. We are aware that there are certain limitations to our data. For example, we have not included unlisted companies. However, we believe the data serves as an appropriate proxy for scale in British business. A detailed documentation of data sources used is available at http://www.cgeh.nl/power-corporate-networks-

comparative-and-historical-perspective. For a more detailed description our method and data and any problems encountered, see, Schnyder and Wilson., 'The Structure of Networks: The transformation of UK business, 1904 – 2010', pp. 48-65.

49. The other year which did not have a full 250 company sample was 2010, the sample for which contained 247 companies. We do not think this shortfall impacted on the overall findings.

50. The sample is organised based on the Standard Industrial Classifications (SIC) used in the database of top 250 companies. The figures are in both total number of firms in sample and percentages to provide an accurate picture of representation in the sample (given the variation in sample numbers in 1983 and 2010). Some specific sectors which can be classified as 'manufacturing' have been separated out using the Bank of England Industrial Analyses statics (ie. food, beverage and tobacco and chemicals/materials), as they are distinct sectors within manufacturing and given unique classifications within SIC..

51. The choice of Pajek for our network visualisations was predicated on the frequency of its use in historical network analysis and the varied network measures it allowed us to employ.

52. Blyler and Coff, "Dynamic Capabilities," 677-686; Badia Miro, Blasco, Lozano, & Soler, "Centrality and investment strategies", 493-515; Salvaj and Couyoumdjian, "'Interlocked'business groups", 129-148.

53. Freeman, "Centrality in Social Networks," 215-39.

54. For sources on the construction of the network and centrality measures, see Schnyder and Wilson, 'The Structure of Networks', pp. 48-65.

55. Wilson, Buchnea & Tilba, "British Corporate Network", 14-17.

56. Cheffins, *Corporate Ownership*, pp. 157-59.

57. Turner, *Banking in Crises*, p. 89.

58. Briston and Dobbins, *Institutional Investors*, p. 54.

59. Toms et al., "The evolution of private equity", 738.

60. Bowden, "Ownership responsibilities and coporate governance," 31-62.

61. Stapledon, *Institutional Shareholders*, pp. 19-20.

62. Capie, *Bank of England*, p. 547; Turner, *Banking in Crises*, p. 89.

63. Our database utilised in our previous article shows a decrease of nearly ten percent from 1958 to 1976.

64. Briston and Dobbins, *Institutional Investors,* pp. 13-14.

65. Cheffins, *Corporate Ownership*, p. 307; Toms and Wright, "Divergence and Convergence," 74-5.

66. Stapledon, *Institutional Shareholders*, pp. 19-20.

67. Cheffins, *Corporate Ownership*, p. 330.

68. Drake, "Efficiency and Productivity,", 557-71; Larson et al., "Strategic Responses to Global Challenges," 40-62.

69. Wilson, Buchnea & Tilba, "British Corporate Network", 14-17.

70. Toms and Wright, "Divergence and Convergence," 74-75.

71. Davis, "A new finance capitalism?" 11-21; Jackson, "A new financial capitalism?" 23-26.

72. Schäfer A. and U. von Arx, "The influence of pension funds", 2316-29; Reisberg, "UK Stewardship Code", 217-53; Tilba and Wilson, "Vocabularies of motive", 502-18.

73. Plender, "London's Big Bang," 39-48;

74. Stapledon, *Institutional Shareholders,* p. 20.

75. Toms and Wright, "Corporate Governance," 91.

76. Billings, Tilba and Wilson, 'To invite disappointment or worse', 1-26.

77. Clark and Hebb, "Why should they care?" 2018; Toms and Wright, "Corporate Governance," 108.

78. Stiles and Taylor, *Boards at Work,* pp. 11-2.

79. Young, "The Increasing Use of Non-Executive Directors," 1311-1342.

80. Conyon and Mallin, "A review of compliance with Cadbury," 24-37.

81. Keasey, Short and Wright, *Corporate Governance*, p. 29.

82. For a detailed analysis of the three main versions of the UK code of corporate governance in Business History, please see McNulty and Nordberg (2013) who identify a shifting discourse of 'structures' in Cadbury to 'independence' under the reforms in 2003, and then in the 2010 iteration towards 'behaviour', as the code seeks to improve boards as mechanisms of corporate governance.

83. Stapledon*, Institutional Shareholders*, p. 20; Tilba and McNulty, '"Engaged versus Disengaged Ownership," 165-82.

84. Hendry et al., "Owners or Traders?" 1101-1132.

85. Aguilera, "Corporate Governance and Director Accountability," 42-43.

86. Examples of such chains in the 2000 network are: National Grid PLC – Energis PLC – Amec PLC – Powergen PLC; and Bank of Scotland – Avis Europe – Henlys Group PLC – Tibbet & Britten Group.

87. Share Register Survey Report, CSO, 2010.

88. Turner, *Banking in Crisis*, p. 95.

89. Clark and Hebb, "Pension Fund Corporate Engagement," 142-71.

90. Share register survey report, CSO, 2008.

91. Share register survey report, CSO, 2010.

92. Giannarakis and Theotokas, "The effect of the financial crisis," 2-10.

93. Share register survey report, CSO, 2008 and 2010.

94. Scott and Griff, *Directors of Industry*, pp. 171-173.

95. Haldane, "Who owns a company?" 17-19.

96. Davis, "A new finance capitalism?" 11-21; Jackson, "A new financial capitalism?" 23-26.

97. Scott, "Corporate control and corporate rule", 351-373; Windolf, "Coordination and Control," 443-57.

98. David and Westerhuis (eds.). *The Power of Corporate Networks*.

99. Hannah, *Rise of Corporate Economy*.

100. Pettigrew and McNulty 'Control and Creativity in the Boardroom', pp. 226-255.